PROVIDENCE CAREER & TECHNICAL ACADEMY

A HIGH PERFORMANCE CAREER & TECHNICAL SCHOOL

Building Facts

- 296,000 square foot Building Area
- Comprehensive College Preparatory Technical High School
- Nine Career Pathways
- 816 Students Grade 9-12
- Special Education & ESL Spaces
- Community Partner & Parent Volunteer Spaces
- Auditorium, Performing Arts, TV Studio and 65,00 square foot Field House
- Wireless Library/Media Research Center
- Demonstration PV Solar and Wind Turbine Systems

Design Accomplishments

- High Performance Green School Includes Re-Use of Existing 72,000 square foot Building
- School Designed as an Interactive Learning Laboratory
- Designed to Operate 41% more Efficiently than Energy Code
- Total Program Cost $28 Million less than Alternative Design Options
- Projected Utility Rebate $110,000
- Projected Present Value Annual Energy Saving $190,000
- Projected Annual Water use Saving of 139,000 gallons

Northeast CHPS Protocol

Policy & Operations	*2 pts*
Indoor Environmental Quality	*3 pts*
Energy Efficiency	*6 pts*
Water Efficiency	*3 pts*
Materials	*3 pts*
Site Selection & Layout	*5 pts*
Innovation	*2 pts*
Total	*24 pts (20 pts required)*

Gilbane

The S/L/A/M Collaborative

STUDIO JAED

ARCHITECTS • ENGINEERS • FACILITIES SOLUTIONS

FIRST FLOOR

The HVAC and Plumbing lab spaces have active solar hot water systems as well as direct access to the building automation system and primary mechanical support space to provide real life learning opportunities.

High efficiency no load transformers operate at 98% efficiency under load and 99% efficiency with no load resulting in a $500,000 energy savings over the life of the transformer.

Variable flow heating and cooling pumps minimize energy usage by providing only the minimum flow rate required to condition spaces at any given time.

High efficiency gas fired hot water heaters work in tandem with preheated solar hydronic system producing 30% energy savings.

Melink variable air volume kitchen hood exhaust system saves electrical energy while preheating kitchen make-up air.

The Cosmetology, Culinary Arts, and Automotive Technology facilities include space to serve the general public providing real life educational opportunities.

High efficiency gas fired condensing boilers operate at 95% efficiency while providing better modulation during low demand periods verses traditional cast iron sectional boilers 80% - 85% efficiency.

Energy recovery units provide tempered air to building with a payback of less than 5 years.

FRICKER STREET MAIN ENTRANCE

Solar thermal hot water collectors produce 30% of annual hot water demand.

Solara glazing provides classrooms with enhanced natural lighting resulting in reduced artificial lighting with corresponding energy savings.

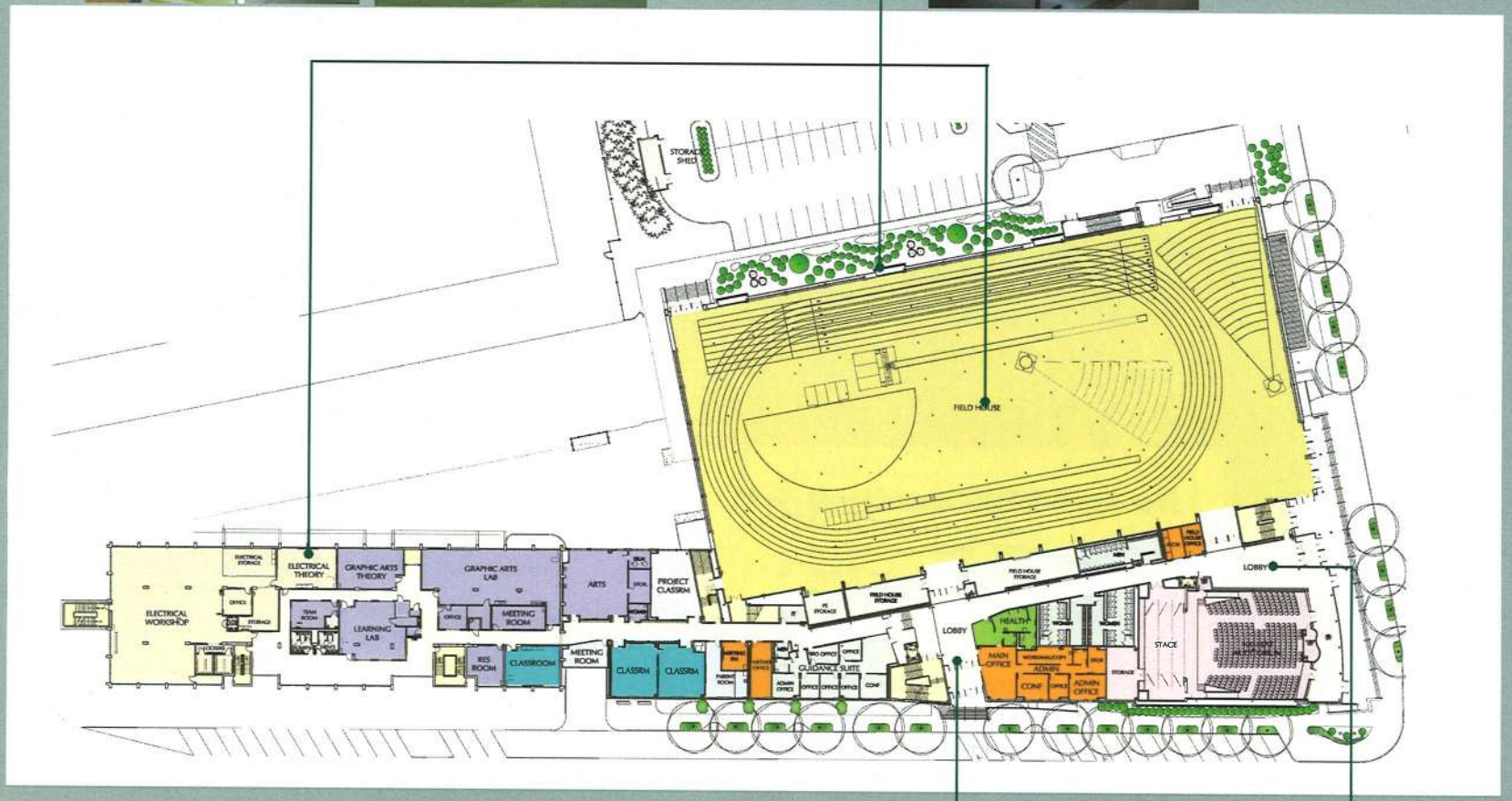
White reflective roofing membrane rejects significant solar heat gain resulting in reduced cooling demand and urban heat island effect.

AUDITORIUM

Faux windows in exterior façade of Auditorium contain programmable LED lighting system capable of displaying continuously varying hues of up to 16 million hues at varying degrees of intensity and sequencing. The system is integrated into the Graphics Communications program for use by the students.

SECOND FLOOR

Daylight scavenging systems are used throughout the school automatically adjusting lighting levels to correspond with available natural light and include power on - off feature to correspond with a spaces current occupancy.



An internet based "Education for Sustainability" system is being provided that describes the building sustainable design and energy savings features through publicly accessible touch screen kiosks. Real time energy savings data is also provided. Additionally the system is accessible through the schools LAN for use by any teacher or student for inclusion in curriculum. Available data will include energy usage by type, water usage, dynamic temperature of key energy savings equipment such as the solar-thermal hot water system, and the energy output of the roof mounted demonstration wind turbine and photovoltaic systems.

THIRD FLOOR

To enhance student understanding of the built environment and the systems inherent in buildings numerous spaces have exposed or grated ceiling systems allowing students to fully observe the built environment around them. This also provides a learning opportunity for integration with core and career path curriculum.

Low flow and waterless fixtures are used through out the facility to achieve significant annual water usage savings.

Daylight scavenging systems are used throughout the school automatically adjusting lighting levels to correspond with available natural light and include power on - off feature to correspond with a spaces current occupancy

The school design accommodates collaborative team teaching and small group independent learning through a variety of ways including communicating classrooms, small group work rooms, commons spaces for small group collaboration and a wireless Library Media Research center.

High Efficiency lighting systems are used throughout the facility saving over $100 per lamp with over 2,500 light fixtures